

ABSTRACT

A method of preparing semiconductor nano crystal anatase TiO_2 solution uses titanium alkoxide Ti(OR)_4 as a main component in combination with chelating agents in aqueous solution. A fluorescent lamp tube is coated with the semiconductor nano crystal anatase TiO_2 solution to form a photocatalytic coating fluorescent lamp capable of cleaning air. Then a baking step is carried out at a low temperature about $100\text{-}250^\circ\text{C}$. By doped anatase TiO_2 with small amount about $0\text{-}1.0$ wt% of precious metals complex or transition metals oxides as nano-particle on or in the anatase TiO_2 nano-particle surface, the visible light photocatalysis efficiency is increased for air cleaning. By doped with small amount Eu^{+3} or rare earth metal ion on or in the anatase TiO_2 nano-particle surface, which is a photocatalytic material acting as fluorescent agent, the fluorescent lamp has increasing brightness of when it is turned on.